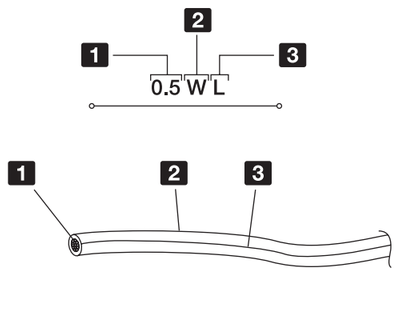
ELECTRICAL WIRING DIAGRAM

Wire color code



2G0AU02

1 Thickness (mm²)
2 Base color
3 Line color*
* : There may be no lines.

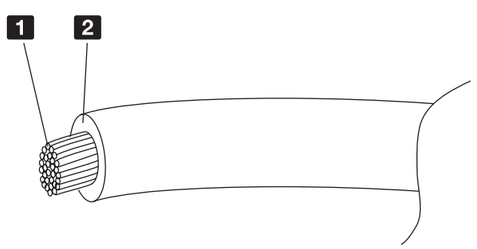
Wire color chart

Code	Color	Code	Color	Code	Color	Code	Color
B	Black	W	White	Br	Brown	V	Violet
G	Green	Y	Yellow	Lg	Light green	Dg	Dark Green
L	Blue	P	Pink	Gr	Grey	Ch	Chocolate
R	Red	Or	Orange	Sb	Sky blue		

Wires used

- Use AVSS for wires with the thickness of 2 mm² or less.
- Use AV or AVS for wires with thickness over 2 mm². (AVX can be used if the desired color is unavailable.)

Code	Description	Features	Heat-resistant temp.
AV	Low-voltage cables for automobiles	• Used for low voltage circuits.	80°C (176°F)
AVX	Heat-resistant cross linked vinyl insulated low-voltage cable	• Compared to AV, heat-resistance is greatly improved. This makes highly reliable wiring used in the automotive wiring environment where there is temperature increase.	100°C (212°F)
AVS	Thin-insulation low-voltage cables for automobiles	• Thinner insulation type of AV wire with the electrical performance equivalent to that of the standard AV wire.	80°C (176°F)
AVSS	Thin-insulation low-voltage cables for automobiles	• Insulation is further thinner than that of the AVS, with the electrical performance equivalent to that of the AVS.	80°C (176°F)



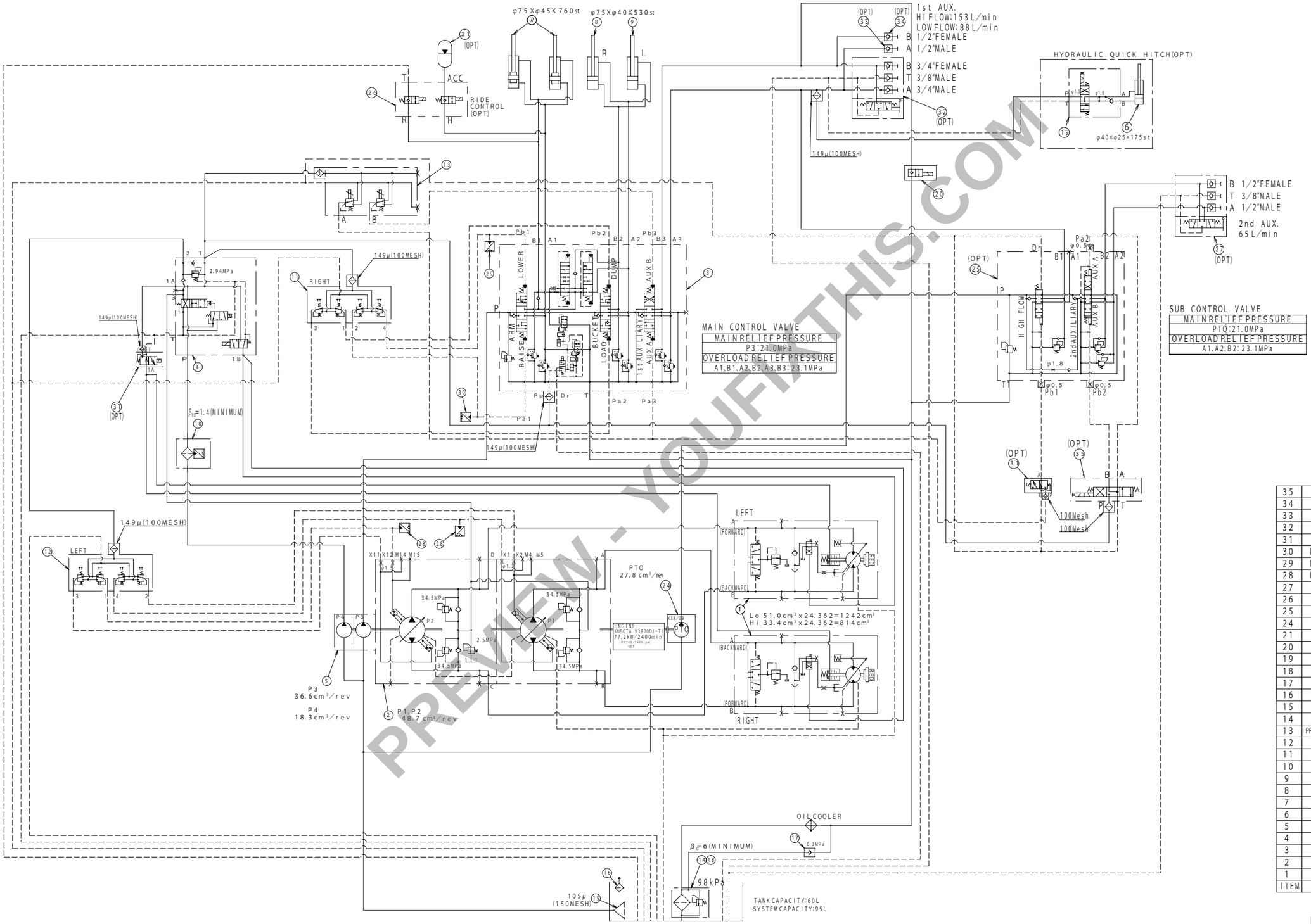
2G0AU03

1 Conductor: Annealed copper wire
2 Insulation: Vinyl

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High-flow specifications



35	SOLENOID VALVE
34	QUICK COUPLER
33	QUICK COUPLER
32	BLOCK COUPLER
31	SOLENOID VALVE
30	PRESSURE-SWITCH
29	PRESSURE-SWITCH
28	PRESSURE-SWITCH
27	BLOCK COUPLER
26	SOLENOID VALVE
25	CONTROL-VALVE
24	GEAR PUMP
21	ACCUMULATOR
20	SOLENOID VALVE
19	SOLENOID VALVE
18	RELIEF VALVE
17	CHECK VALVE
16	AIR BREATHER
15	SUCTION FILTER
14	RETURN FILTER
13	PROPORTIONAL SOLENOID VALVE
12	REMOTE C.V. (L)
11	REMOTE C.V. (R)
10	LINE FILTER
9	BUCKET CYLINDER (L)
8	BUCKET CYLINDER (R)
7	ARM CYLINDER
6	QUICK HITCH CYLINDER
5	GEAR PUMP
4	SUB VALVE
3	CONTROL-VALVE
2	HST PUMP
1	TRAVEL MOTOR
ITEM	NAME OF PART

HYDRAULIC CIRCUIT DIAGRAM
In Compliance with EC(NRMM) EPA Tier4

Drawing No.	1/1
06901-00420-1	

2F0AU02

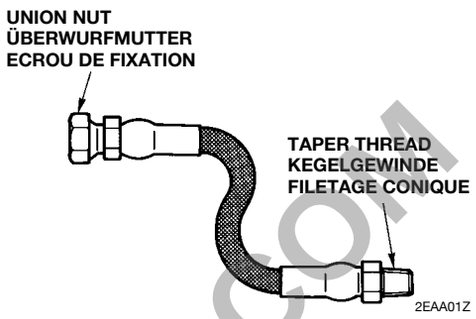
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TIGHTENING TORQUE

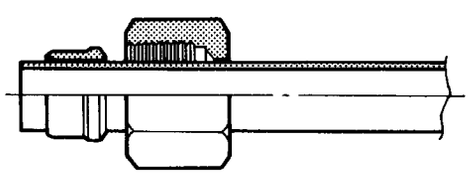
Hydraulic hose

Hose fitting size	Tightening torque			
	Union nut (G)		Taper thread (R)	
	N·m	ft-lb	N·m	ft-lb
1/8	$9.8^{+4.9}_{0}$	$7.3^{+3.5}_{0}$	11.8 ±1.2	8.7 ±0.8
1/4	$24.5^{+4.9}_{0}$	$18.1^{+3.5}_{0}$	29.4 ±2.9	21.7 ±2.1
3/8	$49.0^{+4.9}_{0}$	$36.2^{+3.5}_{0}$	53.9 ±5.4	39.8 ±3.9
1/2	$58.8^{+4.9}_{0}$	$43.4^{+3.5}_{0}$	88.3 ±8.8	65.1 ±6.4
3/4	$117.7^{+4.9}_{0}$	$86.8^{+3.5}_{0}$	147.1 ±14.7	108.5 ±10.7
1	$137.3^{+4.9}_{0}$	$101.3^{+3.5}_{0}$	196.1 ±19.6	144.7 ±14.3



Bite-type pipe fitting for steel pipe

Pipe outer diameter (mm)	Tightening torque	
	N·m	ft-lb
8	34.3 ±4.9	23.5 ±3.5
10	41.7 ±2.5	30.7 ±1.7
12	58.8 ±4.9	43.4 ±3.5
15	88.3 ±4.9	65.1 ±3.5
16	93.2 ±4.9	68.7 ±3.5
18	132.4 ±4.9	97.6 ±3.5
22	205.9 ±9.8	151.8 ±7.2
27.2	245.2 ±9.8	181.0 ±7.2
28	313.8 ±19.6	231.4 ±14.3
32	313.8 ±19.6	231.4 ±14.3
35	411.9 ±19.6	303.7 ±14.3



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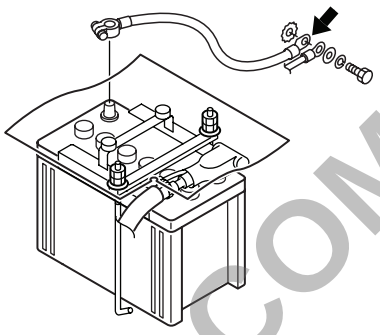
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Removing the engine

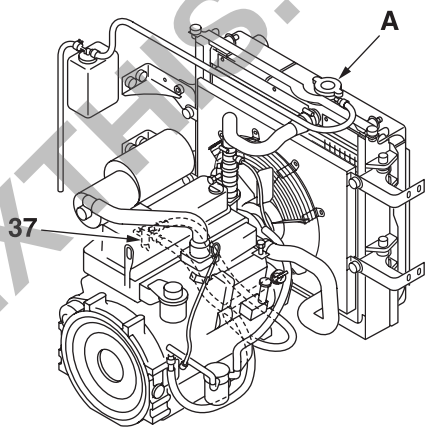
⚠ WARNING

Securely wrap or otherwise isolate the disconnected terminal to ensure that it does not make contact with the body or other parts.

1. Disconnect the ground cable on the battery from the engine body.

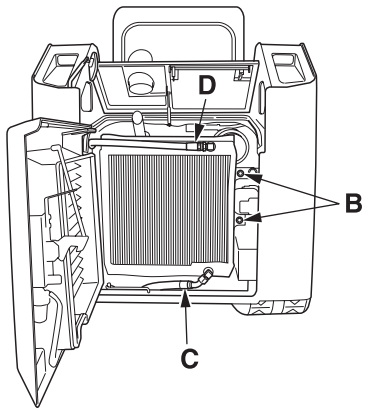

4B0AU02

2. Drain off the engine coolant.
   a. Remove the radiator cap (A).
   b. Loosen the drain cock (37), and let the engine coolant drain out.
      • Engine coolant volume: 16.5 L (17.4 US qt.)
3. Drain off the hydraulic oil from the hydraulic tank.
   ☞"Removing the hydraulic tank"
   • Total oil volume: 95 L (100 US qt.)
4. Remove the covers.
   ☞"Removing the covers"
5. Disconnect the hoses on the air conditioner.
   • For air conditioner specifications only
   ☞"Removing the air conditioner"
6. Remove the canopy.
   ☞"Removing the canopy"
7. Remove the floor frame.
   ☞"Removing the floor frame"



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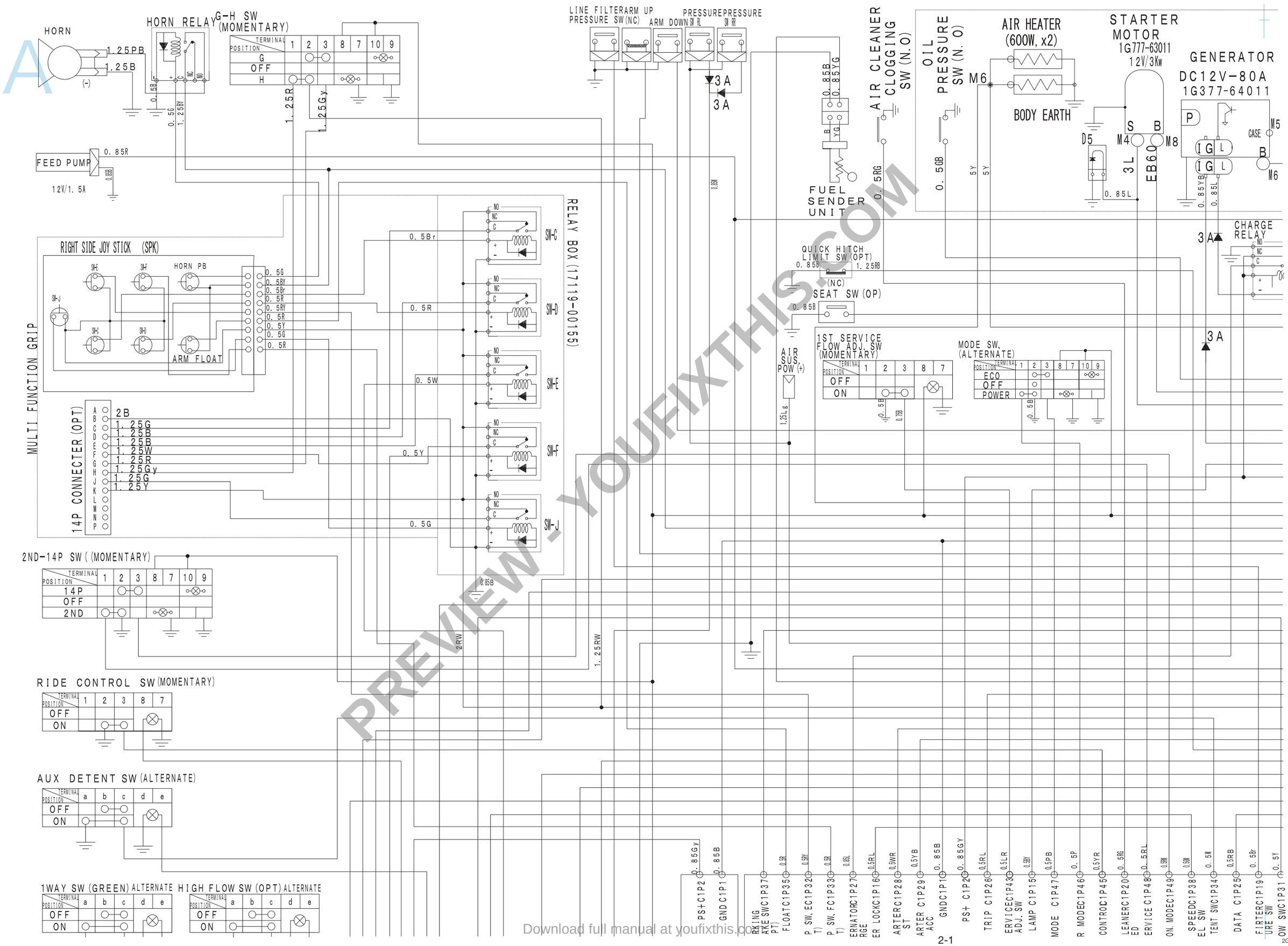
8. Remove the radiator assembly (6).
   a. Remove the bolts (B), and open the radiator assembly.
   b. Disconnect the hoses (C) and (D).
      • Prepare a plate to catch drips of hydraulic oil.
   c. Disconnect the hose (34).
   d. Remove the bands, and disconnect the hoses (21) and (22).
      Band: 5 N·m (3.7 ft.-lb)
   e. Remove the bands, and disconnect the hoses (15) and (16).
      Band: 5 N·m (3.7 ft.-lb)
   f. Remove the pin (38), and remove the radiator assembly (6).
      Radiator assembly: 76kg (168 lb)
      • During assembly, the radiator is to be mounted at a right angle to the frame and parallel to the cooling fan.



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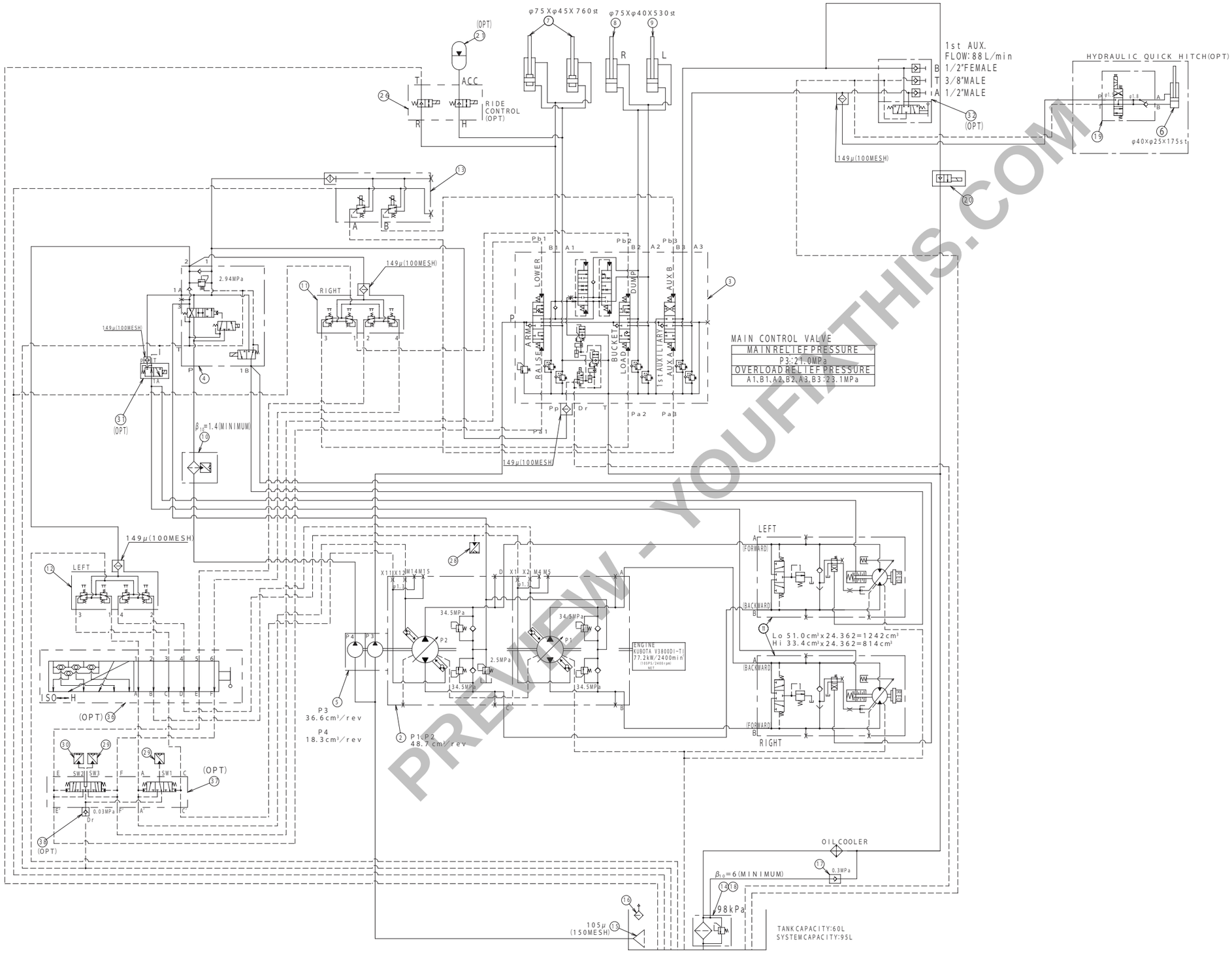
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Standard specifications (For models with a selector valve)



38	CHECK VALVE
37	SHUTTLE VALVE
36	SELECTOR VALVE
35	·
34	·
33	·
32	BLOCK COUPLER
31	SOLENOID VALVE
30	PRESSURE SWITCH
29	PRESSURE SWITCH
28	PRESSURE SWITCH
27	·
26	SOLENOID VALVE
25	·
24	·
21	ACCUMULATOR
20	SOLENOID VALVE
19	SOLENOID VALVE
18	RELIEF VALVE
17	CHECK VALVE
16	AIR BREATHER
15	SUCTION FILTER
14	RETURN FILTER
13	PROPORTIONAL SOLENOID VALVE
12	REMOTE C.V. (L)
11	REMOTE C.V. (R)
10	LINE FILTER
9	BUCKET CYLINDER (L)
8	BUCKET CYLINDER (R)
7	ARM CYLINDER
6	QUICK HITCH CYLINDER
5	GEAR PUMP
4	SUB VALVE
3	CONTROL VALVE
2	HST PUMP
1	TRAVEL MOTOR
ITEM	NAME OF PART

HYDRAULIC CIRCUIT DIAGRAM
In Compliance with EC(NRMM) EPA Tier4

Drawing No.	1/1
06901-00430-1	

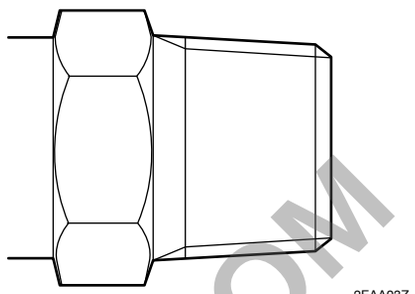
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Joint for piping

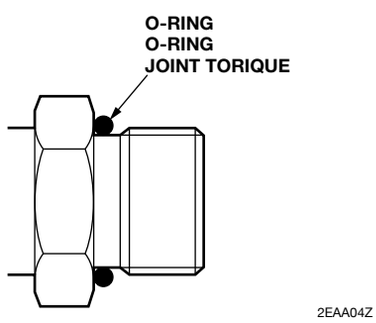
Nominal thread diameter	Tightening torque			
	Steel		Cast steel	
	N·m	ft-lb	N·m	ft-lb
1/8	11.8 ±1.2	8.7 ±0.8	10.8 ±1.1	8.0 ±0.7
1/4	29.4 ±2.9	21.7 ±2.1	24.5 ±2.5	18.1 ±1.7
3/8	53.9 ±5.4	39.8 ±3.9	49.0 ±4.9	36.2 ±3.5
1/2	88.3 ±8.8	65.1 ±6.4	73.5 ±7.4	54.3 ±5.3
3/4	147.1 ±14.7	108.5 ±10.7	127.5 ±12.7	94.1 ±9.3
1	196.1 ±19.2	144.7 ±14.3	171.6 ±17.2	126.6 ±12.5


2EAA03Z

Joint for piping (O-ring seal type)

Nominal thread diameter (G)	Tightening torque	
	N·m	ft-lb
1/8	19.6 ±2.0	14.5 ±1.4
1/4	34.3 ±4.9	25.3 ±3.5
3/8	53.9 ±4.9	39.8 ±3.5
1/2	63.7 ±4.9	47.0 ±3.5
3/4	93.2 ±4.9	68.7 ±3.5
1	107.9 ±9.8	79.5 ±7.2
1-1/4	117.7 ±9.8	86.8 ±7.2
1-1/2	137.3 ±9.8	101.2 ±7.2

Nominal thread diameter (UNF)	Tightening torque	
	N·m	ft-lb
7/19-20	16.7 ±2.0	12.3 ±1.4
1/2-20	22.6 ±2.0	16.6 ±1.4
9/16-18	31.4 ±2.9	23.1 ±2.1
3/4-16	59.8 ±4.9	44.1 ±3.5
1-1/16-12	102.0 ±5.9	75.2 ±4.4
1-5/16-12	135.3 ±7.8	99.8 ±5.8
1-5/8-20	181.4 ±9.8	133.8 ±7.2

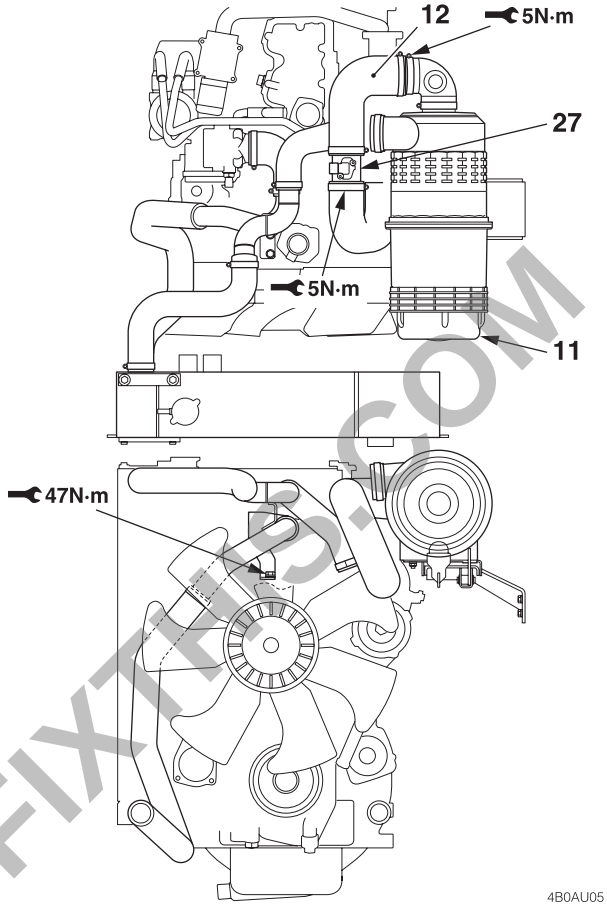


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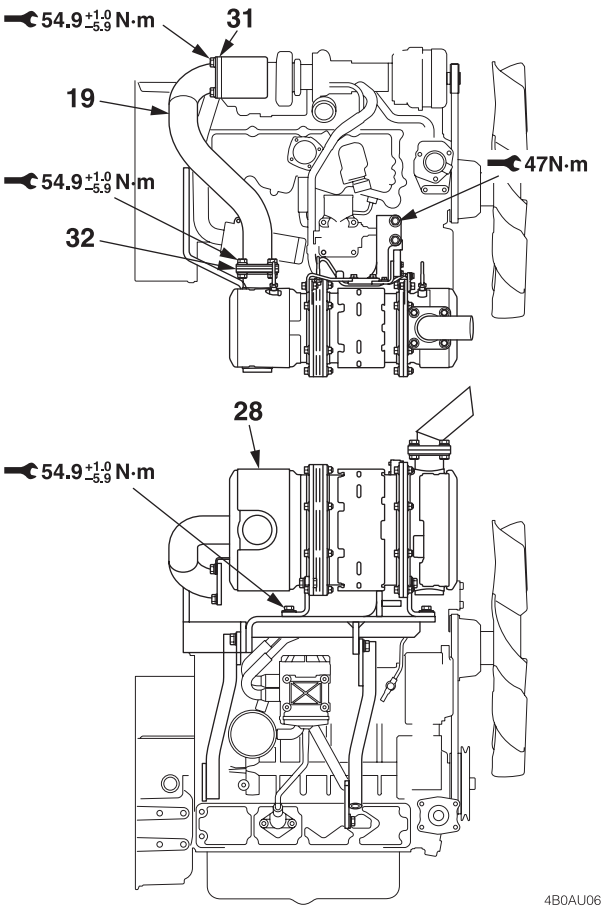
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9. Remove the precleaner assembly (11).
   a. Disconnect the electrical wiring to the air flow sensor (27).
   b. Loosen the band, and remove the hose (12).
      Band: 5 N·m (3.7 ft.-lb)
   c. Take out the bolts, and remove the precleaner assembly (11).



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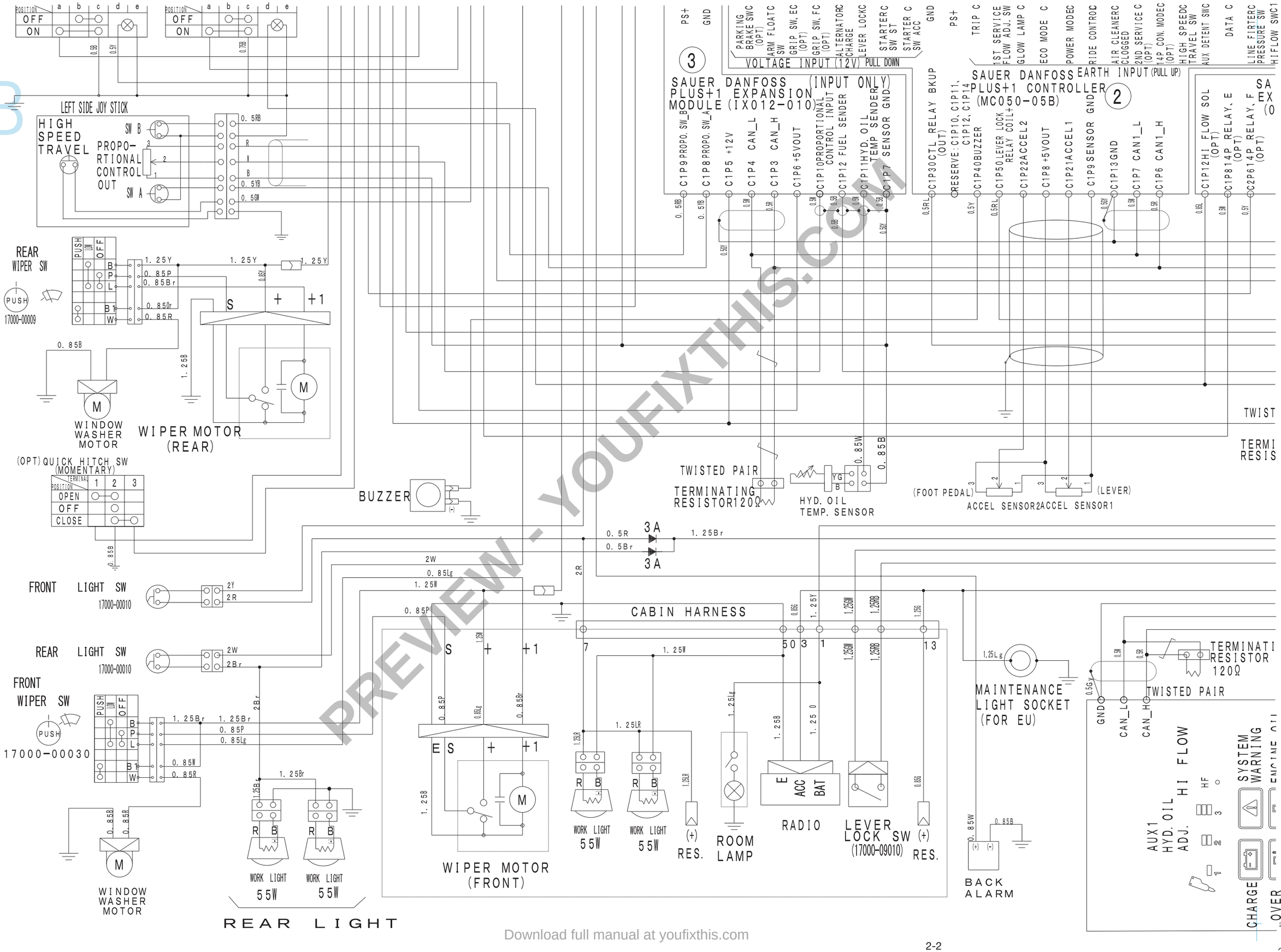
10. Remove the DPF assembly (28).
   a. Disconnect the electrical wiring to the sensors in the DPF.
   b. Take out the bolts, and remove the pipe (19).
      Bolt: 54.9 $^{+1.0}_{-5.9}$ N·m (40.5 $^{+0.7}_{-4.4}$ ft.-lb)
      • During assembly, take out the gaskets (31) and (32) and replace them with new ones.
   c. Take out the bolts, and remove the DPF assembly (28).
      Bolt: 54.9 $^{+1.0}_{-5.9}$ N·m (40.5 $^{+0.7}_{-4.4}$ ft.-lb)
      • Disassembly of the DPF
      ☞ "Engine Workshop Manual"



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Bolts and nuts (JIS strength category 10.9)

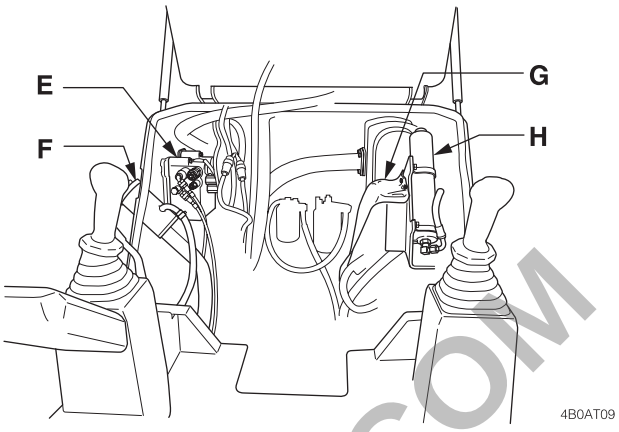
Thread	Size × pitch	Tightening torque			
		General tightening points		Special tightening points	
		N·m	ft-lb	N·m	ft-lb
Coarse	M6 × 1.0	9.8 ±0.5	7.2 ±0.4	11.8 ±1.1	8.7 ±0.4
	M8 × 1.25	22.6 ±1.1	16.6 ±0.8	26.5 ±2.5	19.5 ±0.9
	M10 × 1.5	47.1 ±2.4	34.7 ±1.7	54.9 ±4.9	40.5 ±2.0
	M12 × 1.75	83.4 ±4.1	61.5 ±3.0	97.1 ±7.4	71.6 ±3.5
	M14 × 2.0	134.4 ±6.7	99.1 ±4.9	155.9 ±12.7	115.0 ±5.7
	M16 × 2.0	207.9 ±10.4	153.3 ±7.7	241.2 ±17.2	177.9 ±8.9
	M20 × 2.5	410.9 ±20.5	303.1 ±15.1	475.6 ±23.7	350.8 ±17.5
Fine	M8 × 1.0	24.5 ±1.2	18.1 ±0.9	28.4 ±1.4	21.0 ±1.0
	M10 × 1.25	50.0 ±2.5	36.9 ±1.8	58.8 ±2.9	43.4 ±2.2
	M12 × 1.5	87.3 ±4.3	64.4 ±3.2	102.0 ±5.1	75.2 ±3.8
	M14 × 1.5	135.3 ±6.8	99.9 ±5.0	157.9 ±7.8	116.5 ±5.8
	M16 × 1.5	220.6 ±11.0	162.7 ±8.1	256.0 ±12.7	188.8 ±9.4
	M20 × 1.5	452.1 ±22.6	333.4 ±16.6	524.7 ±26.1	387.0 ±19.2

1. General tightening points (non-lubricated)
   All securing points that have no special tightening torque specified in this manual and that are not special tightening points.
2. Special tightening points (grease with molybdenum disulfide applied)
   Points where a specific tightening torque is specified in this manual.
3. Points where thread-locking compound should be applied (ThreeBond #1324).
4. If a tightening torque value is specified in this manual for a point not listed in the table above, follow the specification in the manual.
5. To tighten multiple bolts and nuts evenly, alternately tighten opposite bolts/nuts as a pair.

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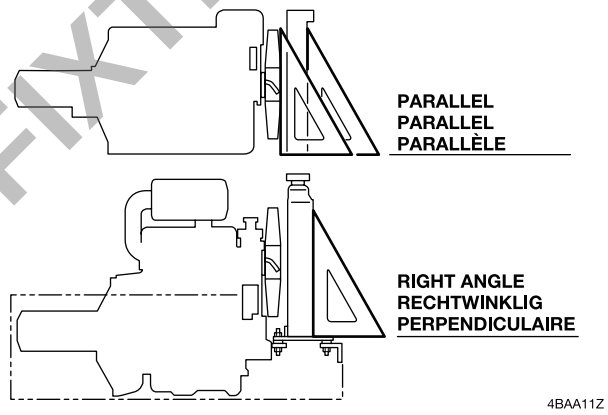
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11. Remove the control valve (E), the fuel filler port (F), the controller (G), and the accumulator (H).
    - Attach identification tags to the disconnected hoses and electrical wires to use during reassembly.
12. Disconnect the electrical wiring to the engine.
    ☞ "Chapter 2: Wire harness diagram"
13. Remove the hydraulic pump.
    ☞ "Removing the hydraulic pump"
14. Remove the engine.
    a. Disconnect the cable (23).
    b. Take out the bolts, and remove the rubber cushions (24) and (25).
       Bolt: ThreeBond #1324 or equivalent
       Bolt: 256 N·m (188.8 ft.-lb)
    c. Suspend the engine.
       : 310kg (684 lb)



Installing the engine

- To install the engine, follow the same procedures as for removal but in the reverse order.
- The radiator is to be mounted at a right angle to the frame and parallel to the cooling fan.



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FOREWORD

This manual, which is written for engineers who service the machine, describes procedures for disassembly and assembly, inspection and maintenance, and troubleshooting, as well as maintenance reference values and an outline of the specifications. Refer to this manual during daily work to improve your services. Note that the information is subject to change without notice due to design modifications made to the machine from time to time by the manufacturer.

Directional terms: front, rear, left, right

In this manual, the “front” refers to the end of the machine where the bucket is mounted, while the “rear” refers to the other end where the travel motor is mounted. The “right” or “left” refers to the side viewed by a person sitting in the operator’s seat.

Machine serial number

The machine serial number is stamped on the identification plate. Be sure to include this number when sending a report or inquiry or when ordering parts.

Control of manual

Appoint a person in charge of keeping the manuals up to date in your company and inform us of the person’s name for our records. Any revisions or additions to this manual will be sent to the person.

Symbols used in this manual

The symbols used in this manual have the following meanings.

S/N Indicates the machine serial number.
Means “Refer to the section quoted.”
kg Indicates the mass of the equipment or machine.
Means “Tighten to the torque specified here.”
Indicates the use of thread-locking compound.
Indicates the use of grease.

Manual structure

This manual consists of the following parts.

1. Safety
2. Service data
3. Function
4. Disassembly and assembly
5. Troubleshooting
6. Other

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SAFETY ALERT SYMBOL



This symbol represents the safety alert. The message that follows the symbol contains important information regarding human safety.
Read and understand the message to avoid personal injury or death.

Safety label

Safety labels are used to alert operators or other people exposed to the risks of injury or damage. There are the following three types of labels.
Read the labels carefully as they are important for your safety.

⚠ DANGER

The word "DANGER" indicates an imminently hazardous situation which, if not avoided, is likely to result in serious injury or death.

⚠ WARNING

The word "WARNING" indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

⚠ CAUTION

The word "CAUTION" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

IMPORTANT: The word "IMPORTANT" is used to alert operators and maintenance personnel about situations which could result in damage to the machine and its components.

This manual is intended for trained and qualified personnel only. Warnings or cautions described in this manual do not necessarily cover all safety measures. It is also impossible to cover all hazards and risks which may be associated with the maintenance of the machine in every environment. For maintenance work, each person must take adequate safety precautions against possible hazards in the respective working environment.

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Operation when arm-raising operation is activated:

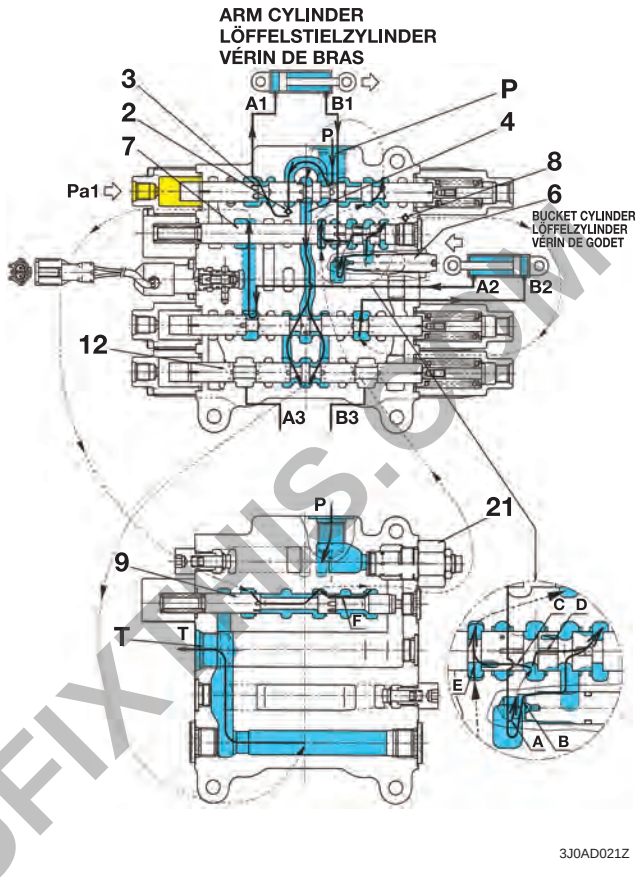
When the arm-raising function is activated, the secondary pressure from the remote control valve enters the port Pa1 to move the arm spool (3). When the arm spool (3) is moved, the center bypass passage (4) is blocked. The oil that entered from the port P is then led into the open port, port A1, via the check valve (2). The oil that flowed into the port A1 is then led to the head side of the arm cylinder and used to extend the arm cylinder.

When the arm cylinder is extended, the oil on the rod side flows into the valve through the port B1. Part of this oil is led to the divider spool (7) via the flow ration adjuster throttle (6) (oil flow B). Most of the oil is led directly to the divider spool (7) (oil flow A).

In the divider spool (7), the flow volume is divided into two parts based on the specified flow ratio: the flow volume that is to be supplied to the bucket cylinder (oil flow D) and any surplus flow volume that is to be drained through the port T (oil flow C).

The flow supplied to the bucket flows through the check valve (8) to the port B2 and is led to the head side of the bucket cylinder. This oil is used to extend the bucket cylinder, causing the bucket to be level.

When the bucket cylinder is extended, the oil on the rod side flows into the valve through the port A2. It further flows through the sequence spool (9), which is activated by the pressure on the bucket cylinder head side, the divider spool (7), and the arm spool (3) and then into the center bypass passage (4) (oil flow E). The oil then flows through each center bypass passage of the arm section, divider section, bucket section, and auxiliary hydraulic spool (12) and down into the tank passage T to return to the tank.



3J0AD021Z

When the bucket cylinder is extended and reaches the stroke end during arm operation, the pressure at the head side of the bucket cylinder becomes high and causes the sequence spool to move even further. This causes the oil that was supplied to the bucket to flow not via the check valve (8) but directly through the sequence spool (oil flow F) to be combined with the oil flow E. The oil flows through each center bypass passage of the arm section, divider section, bucket section, and auxiliary hydraulic spool (12) and then down into the tank passage T to return to the tank. In this way, the arm-raising operation can be continued.

If the remote control valve for the arm is returned to the neutral position, the arm spool will be returned to the neutral position by the force of the return spring, which will cause the arm operation to stop.

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SAUER DANFOSS

4T Tandem Piston Pump
Repair instructions
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TORQUE CHART

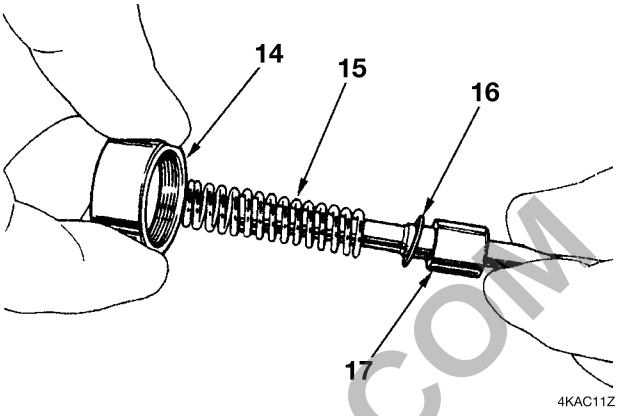
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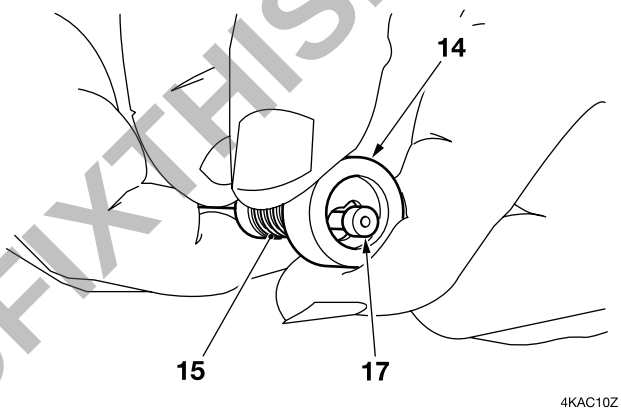
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Assembly

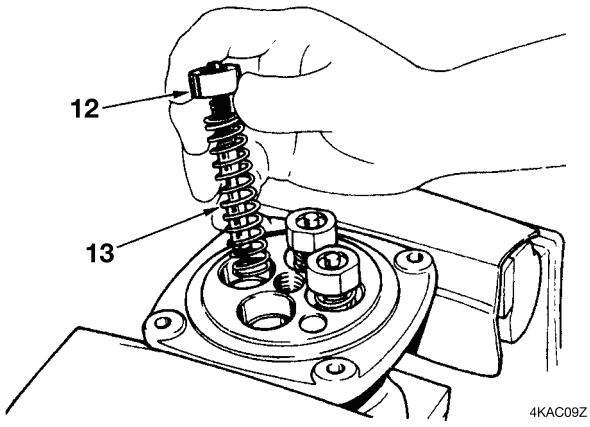
1. Assemble the reducing valve (12).
   a. Place the washer 2 (16), the spring (15), and the spring seat (14) on the spool (17).



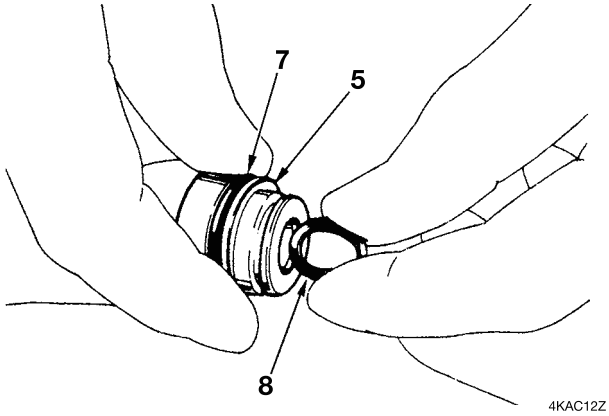
   b. Push in the spring seat (14) to compress the spring (15) and to move the spool (17) from the large hole side to the small hole side of the spring seat (14).
      • The spring seat (14) is not to be pushed down by more than 6 mm (0.24 in.).



2. Install the spring (13) and the reducing valve (12).
   • Install them in the locations where they were before disassembly.



3. Fit the O-ring (7) and the seal (8) to the plug (5).

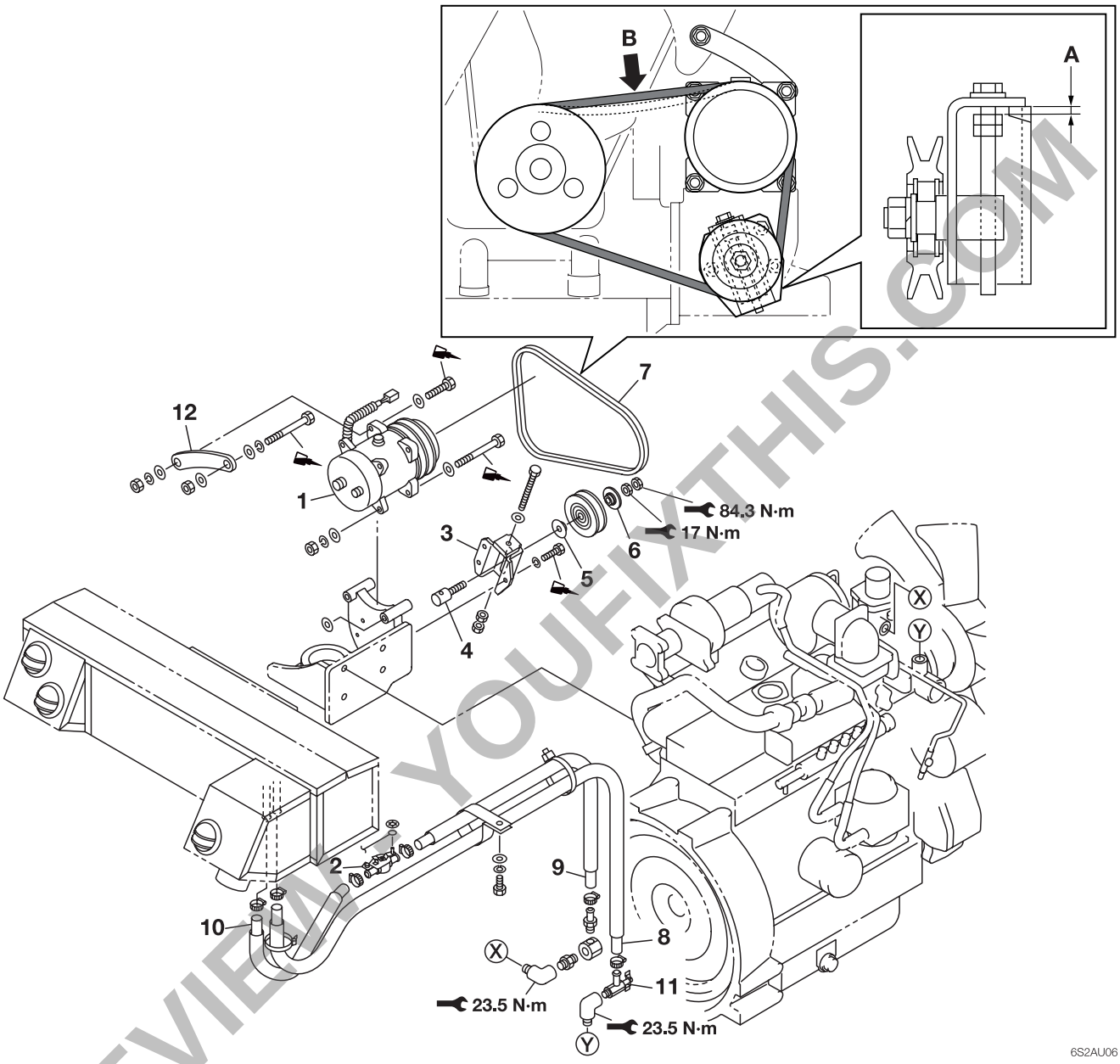


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AIR CONDITIONER

Compressor assembly



A: Create a clearance.
B: Adjust the fan belt until it yields approximately 8 mm when a force of 98N is applied to a middle point between the pulley and the compressor.

1. Compressor
2. Valve
3. Bracket
4. Shaft
5. Collar
6. Pulley
7. Belt
8. Hose
9. Hose
10. Hose
11. Valve
12. Stay

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